Natural Resources Institute

NAMIBIA

Profile of Agricultural Potential

NATURAL RESOURCES INSTITUTE
Overseas Development Administration

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FACT SHEET

Total Area:	**824 292sq km**
Land Use(1988):	
Cropland	**6 620sq km**
Woodland and Bushland	**184 200sq km**
Rangeland	**529 060sq km**
Population(1990):	
Total	**1.78m**
Urban	**27.8%**
Economically active	**0.5m**
Economically active in agriculture	**35.9%**
Average annual growth(1985-90)	**3.2%**
Projected 2025	**4.7m**
Index of Agricultural Production(1979-81=100):	
Total production(1988-90)	**123**
Per capita production(1988-90)	**93**
Gross National Product(GNP):	
Per capita 1989	**US$ 1188**

1. INTRODUCTION

With an area of 824 292 sq km Namibia is more than three times the size of the UK. It consists of a coastal plain and a high plateau separated by an escarpment 80 to 130km inland from the coast. German colonial interest in access to the Zambezi river is responsible for the eccentric shape of the country.

FAO classifies 78% of Namibia as arid and 21% as semi-arid, making the country the driest in southern Africa. The only relatively well-watered part is the north-eastern corner, where more than half of the population of about 1.8 million live.

At independence in 1990 Namibia inherited a badly integrated and sectorally unbalanced economy. About 90% of the goods produced in the country were exported and about 90% of the goods used in the country, including about half of the food, were imported. The minerals sector provided about three-quarters of total export earnings, and agriculture was dominated by the export-oriented commercial ranching sector. Namibia derived virtually no benefits from the fishing industry, which was, in any case, suffering the effects of more than two decades of unsustainable levels of exploitation by South African and foreign fishing fleets.

Mining remains by far the most productive sector of the Namibian economy, but export earnings from minerals are in decline. They fell by about 20% in value in 1991. The gradual depletion of high-grade diamond deposits, declining demand for uranium oxide and falling world prices are all contributory factors. Currently two companies, Consolidated Diamond Mines and Rössing Uranium, are responsible for about 75% of mineral exports, but efforts are under way to diversify production in the sector. Interest in oil exploration has been stimulated by discoveries of large reserves of off-shore natural gas, and there are known to be major unexploited deposits of other commercially valuable minerals. Gold production began in 1989, and seabed mining of diamonds has started, to offset the declining output of on-shore mining areas.

With a *per capita* GNP variously estimated but in excess of US$1 000, Namibia is classified by the UN as a Middle Income Country. The division of income is however highly skewed. The World Bank estimates that the richest 5% of the population, who are mostly white, receive 70% of the national income. The average *per capita* income of the remaining 95% of the population is estimated to be well below the level which would entitle Namibia to Least Developed Country status, and thus special assistance. This problem has been recognised by some of the country's cooperating partners, including the EC, and Namibia has acceded to the Lomé Convention as an Least Developed Country.

In Namibia the extreme degree of income inequality is combined with widespread absolute poverty. The UN estimates that at least two-thirds of the population are poor, and the 40% of households headed by women are amongst the poorest of the poor. Increasing unemployment in the modern (market oriented) sector, which employs approximately 45% of the economically active population, is leading to a significant growth in urban poverty. Nevertheless three-quarters of the poor still live in rural areas, where average *per capita* income in the subsistence farming sector in 1988 was only US$ 85.

One of the root causes of structural inequality in the country is considered to be unequal access to land, and land reform emerged as a highly contentious issue in post-independence Namibia. The 1991 *National Conference on Land Reform and the Land Question* sought to achieve a consensus on a programme of action to tackle the problem. The conference accepted the impracticality of attempting to restore pre-colonial patterns of land ownership. Large-scale state purchase of land was also ruled out in favour of selective acquisition of vacant and 'under-utilised' ranches. The conference appeared to endorse the view that the only productive and efficient way of managing rangeland that is environmentally sound is to subdivide it into large commercial units, a view that is not without it's critics. The difficult issues involved in providing land for the landless were barely discussed during the conference, though it is possible that the satisfactory resolution of the Walvis Bay sovereignty question may now permit more radical land reform measures to be considered.

2. OVERVIEW

Agriculture

In the 1950s the agriculture sector contributed about 45% to the nation's GDP. By the 1980s, with the development of mining, this had declined to about 10%, and the contribution of domestic food production to GDP was less than 3%, amongst the lowest in the world. Nevertheless agriculture is by far the most important employer in the country and it continues to be of major significance to the economy. 70% of the population are dependent on agriculture for their livelihood, and up to 90% spend at least part of their lives on the land.

At independence the agriculture sector was divided into three distinct parts. Commercial ranches, almost all white owned, many by absentee landlords, occupied about two-thirds of the usable farmland of the country; in the north about 120 000 smallholder families practiced mixed farming on about 5% of the usable farmland; and there were about 20 000 livestock-raising households on reserves in the centre and south of the country.

The livestock sub-sector dominates agriculture. Rainfed arable farming is possible only in the extreme north and, even there, conditions are marginal for most crops. In 1989 the national herd consisted of about 3.06m sheep, 1.46m goats and 1.69m head of cattle. Cattle can be grazed only on the relatively better watered northern parts of the plateau. The vegetation in most of the country can support only smallstock.

More than 90% of commercial agricultural output consists of livestock products. The main ones are beef, mutton, wool and Karakul sheep pelts. Before independence over 90% of beef production was exported, much of it on-the-hoof to South Africa. All Karakul pelts were also exported. Under the Lomé convention, Namibia has been granted an annual quota to supply beef to the EC (13,000 tonnes in 1993, '94 and '95). This helps to reduce dependence on a single market, and has necessitated expansion of slaughtering and processing facilities.

Agricultural research has concentrated almost exclusively on livestock. Programmes were developed to serve the needs of commercial ranchers and are not well suited to addressing the post-independence concern for the smallholder mixed farming sector. Breeding is the main activity and is aimed at adapting exotic breeds to the harsh arid environment, and developing uniform wool colour in sheep and goats. Less research has been done on pasture improvement and very little has been done on the impact of livestock management on the environment.

Agriculture in Namibia is regularly affected by drought. The 1979-85 drought was particularly severe and caused a significant fall in the size of livestock herds. Post-independence attempts to increase cereal production received a set-back in the drought of 1992. A record 25 000 ha of maize were planted after the good rains of 1991 but 80% of the projected yield of 50 000 tonnes (equivalent to 75% of domestic demand), was lost.

Water is the scarcest resource and the most critical constraint on agricultural development in Namibia. Currently only about 6 500 ha of land are under any form of irrigation (only 100 ha in communal areas). Even this comparatively small area is estimated to consume a quarter of the available water resources. The possibilities for developing the remaining 25 000 ha of potentially irrigable land are severely limited. There are no perennial rivers within the countries borders, apart from a short stretch of the Okavango where it crosses the Caprivi Strip, and groundwater resources are already heavily exploited.

Sea Fisheries

Potentially Namibia has the richest sea fisheries in tropical Africa and one of the richest in the world. The

cold Benguela current flowing north past the Namibian coast is rich in nutrients, and it can support very large populations of commercially important fish. Pilchards and anchovy are the focus of the in-shore fishing industry, and hake and horse-mackerel are the most important off-shore fish. The exploitation of in-shore resources is locally based, while off-shore stocks are fished mostly by long-distance trawler fleets.

Between 1966, when the UN General Assembly revoked South Africa's mandate, and independence in 1990, there were no effective restrictions on fishing in Namibian waters. This resulted in massive over-fishing by foreign fishing fleets and a collapse in fish stocks. By the mid 1980s the pilchard catch was only 3% of what it was at its peak in the late 1960s. The hake catch was reduced by 80%, and by 1990 most of the hake caught was less than one-year old.

Since independence the government has imposed tight controls on fishing in its internationally recognised fishing zone. The 1992 interim agreement reached with South Africa to establish a joint authority to administer the Walvis Bay enclave and its ten off-shore islets has enabled Namibia to control access to its fisheries resources and to manage all exploitation within 370km of the coast.

A policy of careful conservation is being followed, and fishing quotas for foreign fleets have been set at very low levels. The severity of this policy has been controversial, and there has been a major dispute with the EC over hake quotas. Nevertheless the policy does seem to be working, and there is evidence that some fish stocks are recovering quite rapidly.

The fisheries sector has the potential to be the main contributor to medium-term growth in employment, output and incomes. Fisheries is already one of the fastest growing sectors of the economy. In recent years it is estimated to have contributed nearly 40% to overall growth. Government policy since independence has had to focus on the need to rebuild depleted stocks, but a major long-term aim of government policy is to develop fisheries into the most important pillar of Namibia's economy.

Foreign fishing organisations are investing heavily in shore-based infrastructure and cold storage facilities, but with so much of industry still in foreign hands there is an urgent need for trained personnel to staff the organisations needed to monitor fishing and fish processing activities. Another pressing need is for more patrol boats to curtail continuing illegal activities by foreign fishing fleets; moreover, for Namibia to maximise potential benefits, the indigenous fishing fleet needs to be considerably expanded.

3. LAND RESOURCE ZONES

Information on the land resources of Namibia is sketchy. There is an urgent need to compile a national land resource database.

Based on information currently available the country can be divided into the four land resource zones shown on the map:

- The coastal desert zone
- The semi-desert zone
- The dry semi-arid zone
- The moist semi-arid zone

The escarpment, which more-or-less coincides with the 100mm isohyet, defines the boundary of the coastal desert. The other zonal boundaries are based on interpretations of small-scale maps, including the 1:4m scale Land Use Potential map produced by the Remote Sensing Centre of FAO in 1983, and the 1:40m scale map showing length of crop growing season in the 1978 FAO *Report on the Agro-ecological Zones Project*.

The driest part of the country is the coastal plain where rainfall is less than 100mm a year. On the plateau mean annual rainfall increases from south-west to north-east, reaching 600mm in the Caprivi Strip.

Bushland and open woodland communities cover much of the central and northern parts of the plateau. Relatively dense woodlands are confined to the far north. The southern part of the plateau is covered with semi-desert steppe vegetation. There is little or no permanent vegetation on the coastal plain.

There are two distinct types of soil on the plateau. To the north and east are *sandveld* soils derived from Kalahari sand formations. These are very infertile soils which readily absorb rainfall. Surface water disappears very rapidly in these areas and only the largest watercourses and pans retain any water throughout the long dry season. Accessible groundwater is limited in quantity and often saline. To the west and south are the relatively good quality *hardveld* soils derived from a variety of parent materials. In these areas many of the streams retain water below the surface throughout the year. Groundwater emerges in scattered springs and can be easily extracted through boreholes.

Both types of soil, and the vegetation they support are fragile and vulnerable to over-exploitation. In the relatively densely settled parts of Ovambo and Kavango in the north environmental degradation is already a significant constraint on production. There are also long term signs of degradation in the vegetation in the commercial ranching areas. The practice of overstocking

in good years and restocking too rapidly after droughts, before the pasture has had time to recover, is widespread. Bush encroachment and the replacement of perennial species by inferior annual grasses are the inevitable consequences, though the severity of the problem does tend to be masked by the regular periods of drought.

The Coastal Desert Zone

Physical Environment

This zone comprises the Namib Desert. It occupies about 18% of the country and is characterised by highly erratic rainfall, detritus soils and virtually no permanent vegetation. Mean annual rainfall ranges from less than 25mm in the central Namib to about 100mm. Periods in excess of twelve months with no rainfall are common.

Towards the escarpment temperatures are high but coastal areas are cool and foggy for much of the year. The cold Benguela current removes most of the moisture from on-shore winds; this process produces the fogs, and is also responsible for the extreme aridity of the coastal strip.

Land Use

Inland from the coast, occasional summer showers produce temporary flushes of vegetation, which can provide some grazing and helps to support wildlife.

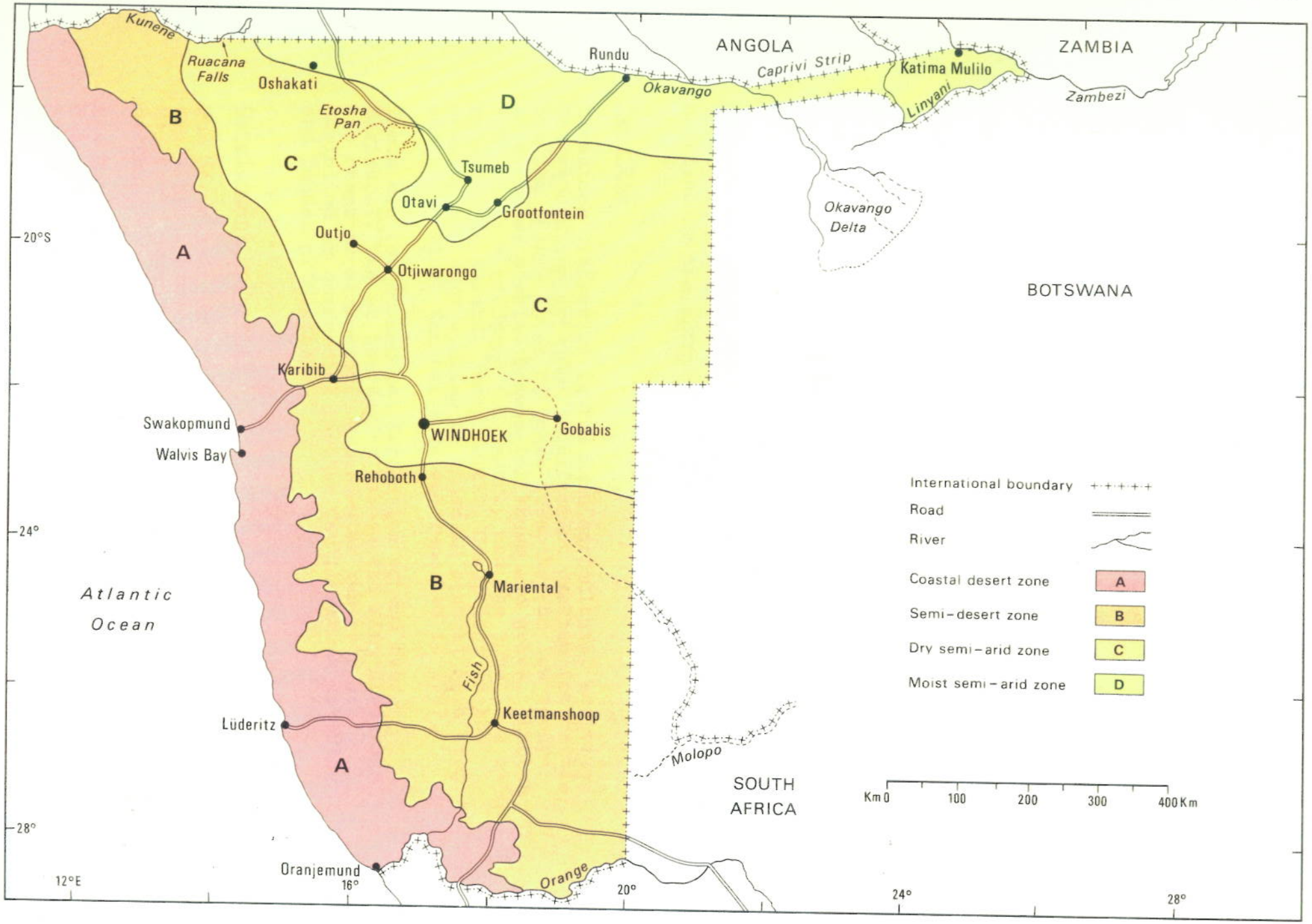
Permanent agriculture is possible only with irrigation. At present the only source of irrigation water is the Orange River, which forms the southern boundary of the country. The Orange is used in a commercial irrigation scheme at Noordoewer, but much of the river's flow is needed for the diamond mines.

The zone is the site of much of the shore-based infrastructure of the commercial sea-fishing industry. Uniquely in sub-Saharan Africa there are no artisanal fisheries competing for the resources with the commercial operators.

The zone also has enormous mineral wealth. Diamond mining is centred on Oranjemund at the mouth of the Orange River, and the largest uranium mine in the world is at Rössing, near Swakopmund.

Development Potential

There is some potential for increasing the area under irrigation. International agreement would be needed to extract more water from the Orange River, but seasonal


Kunene
Ruacana Falls
Oshakati
Etosha Pan
Rundu
ANGOLA
Caprivi Strip
Katima Mulilo
ZAMBIA
Okavango
Linyanti
Zambezi
Tsumeb
Otavi
Grootfontein
Okavango Delta
Outjo
Otjiwarongo
BOTSWANA
Karibib
Swakopmund
Walvis Bay
WINDHOEK
Gobabis
Rehoboth
Mariental
Atlantic Ocean
Fish
Keetmanshoop
Lüderitz
Molopo
SOUTH AFRICA
Oranjemund
Orange
20°S
24°
28°
12°E
16°
20°
24°
28°
A
B
C
D
International boundary
Road
River
Coastal desert zone
Semi-desert zone
Dry semi-arid zone
Moist semi-arid zone
Km 0
100
200
300
400 Km

flows in the Fish River and its tributaries could be impounded and used for irrigation. Elsewhere there is virtually no potential for agricultural development.

Tourism could be developed, based on the two existing protected areas; the Namib-Naukluft National Park near Walvis Bay; and the Skeleton Coast National Park further north. The zone is well endowed with the sort of dramatic landscapes and wilderness areas that have tourist appeal.

The Semi-Desert Zone

Physical Environment

This unit covers about 30% of the land area of the country, and includes the whole of the plateau south of Rehoboth. It comprises areas of the plateau where the mean annual rainfall is between 100 and 250mm. The rainfall is erratic, and most of it is received as highly localised downpours. A single storm can often represent 20% or more of annual rainfall.

Semi-desert dwarf shrubland vegetation covers much of the zone. In the north this gradually changes to *Acacia* bushland as the rainfall increases.

Land Use

Livestock production is the main agricultural activity. The vegetation provides insufficient grazing for cattle, but the sparse cover of grass tussocks and low woody shrubs does provide browse for sheep and goats. Mutton and wool are produced for export, and the zone is a major producer of Karakul sheep pelts. Conditions in the country are very similar to those in central Asia from where the first Karakul herd was imported in 1907.

There are two commercial irrigation scheme near Mariental, one at the Hardap Dam on the Fish River and the other at Stampriet. Groundwater reserves are exploited on commercial ranches for livestock watering and fodder production.

Development Potential

The potential for irrigation in this zone is limited to small areas around existing water sources. The most realistic prospects for development lie in the livestock sector.

The Karakul sheep is popularly known as the 'black diamond' of Namibia, and the country is one of the world's main producers of Karakul products. The adult

sheep produce meat and wool, but the most profitable products are lamb pelts. During the 1970s exports frequently exceeded three million pelts a year, and Namibian pelts accounted for about half of those traded internationally. There was a substantial decline in the market during the 1980s however, and exports had fallen by more than 80% by the end of the decade.

The recent de-stocking in the mink industry has raised hopes that the decline in the market for Karakul products could soon be reversed. A programme to expand production in previously neglected communal farming areas would be an appropriate response to improved marketing prospects. Even under existing market conditions, upgrading the standard of pelt production in the communal areas to the level achieved on commercial ranches would significantly increase the income of farmers in those areas.

There is also potential for increasing employment opportunities by enlarging the existing facilities for processing Karakul products. More of existing pelt production could be tanned and processed into finished garments, and the existing small-scale weaving industry based on Karakul wool could also be expanded.

The market for Karakul pelts is subject to the vagaries of fashion and some diversification would be prudent to avoid over-reliance on this commodity. Commercial ranchers have already switched part of their production to more profitable, but less environmentally kind, breeds of sheep and goats.

The development of game cropping is another possibility. Wild animals are better adapted to the environment and make more efficient use of grazing and browse than domestic livestock, particularly in marginal areas. They also attract tourists. Before independence Namibia produced a significant quantity of game meat, but the international marketing of game products was largely controlled by South African companies. Since independence exports of Namibian game meat have declined. Prices in the main European export markets have been depressed by the substantial rise in exports of game meat from eastern Europe, and the Namibian industry has not been able to respond to these adverse marketing conditions as effectively as it should because of the lack of international marketing expertise within the country.

Productive agriculture in this part of Namibia is heavily dependent for its survival on water from expensively drilled boreholes. The groundwater resources are gradually being exhausted and wide areas are subject to controls on the spacing of boreholes and on the rate of pumping. With no cheap alternative source of water available, the long-term prospects for farmers in this part of the country may be bleak.

The Dry Semi-Arid Zone

Physical Environment

This zone comprises the northern uplands, the central uplands and part of the Kalahari. Mean annual rainfall ranges from 250 to 500mm. Mountain ranges in the central plateau area contain substantial deposits of minerals.

The vegetation consists of open *Acacia* woodland and bushland, with *Aristida, Eragostis* and *Schmidtia* grassland, which in the *hardveld* areas provide good pasture for livestock. In the *sandveld* areas to the east, lack of surface water combined with serious mineral deficiencies and salinity problems produce much lower quality pastures.

Land Use

The vegetation in this zone make it suitable for both large and small stock. Beef production is the main activity, though in the drier areas sheep and goats outnumber cattle. The commercial ranching sector is well developed particularly on the *hardveld* areas in the central and northern parts of the plateau. Commercial beef and dairy production is concentrated in this zone.

Development Potential

There is scope for increasing dairy production, and for expanding local facilities for processing beef and other livestock products. Game cropping, which integrates well with beef production, could also be developed.

Commercial marketing of livestock by subsistence farmers could be greatly increased. Cattle diseases are however a critical problem in the communal farming areas in the north of the country. There is a veterinary cordon fence which isolates cattle in northern Namibia, and there are severe restrictions on the movement and sale of cattle and meat from this area. Apart from an abattoir in Oshakati, which buys all meat at low canning meat prices, marketing is restricted to roadside butcheries and some cross-border trade with Angola. A programme of animal disease control is urgently needed to enable livestock producers in the north to gain access to national and export markets. The enhanced off-take that would result would not only increase the incomes of the subsistence farmers of these areas, it might also have the effect of reducing the pressure on severely over-exploited grazing resources.

The potential for developing irrigated farming is limited. There are no perennial rivers in the zone, and much of the seasonal flow is already impounded on commercial ranches for livestock watering. The

groundwater resources are also heavily exploited by commercial ranchers.

The Moist Semi-Arid Zone

Physical Environment

This zone occupies the north-eastern corner of Namibia. It is the wettest part of the country and mean annual rainfall exceeds 500mm.

The climate of the eastern extremity of the Caprivi Strip is probably sub-humid rather than semi-arid, but the area involved is too small to warrant creation of a separate unit.

Most of the zone consists of *sandveld* with infertile, often saline soils, poor quality pasture and little or no water in the dry season. Little use is currently made of these areas.

Conditions are better in the Otavi Highlands or *karstveld*, and in alluvial areas along the Okavango River valley, on the Ovambo floodplain and in the eastern Caprivi Strip. On the Ovambo floodplain a series of broad shallow channels called *oshanas* distribute seasonal floodwater flowing from Angola in the north. Water flowing through the *oshana* network towards the Etosha Pan is prevented from mixing with the saline groundwater by an impervious subsoil layer.

These better areas provide suitable conditions for mixed farming, but together they amount to less than 5% of the country's land area. More than half the population of Namibia live in these areas, and livestock densities are the highest in the country. Land degradation is a serious and growing problem.

The perennial rivers of the north-east and the *oshanas* all contain significant populations of freshwater fish.

This zone includes the only areas of dense woodland in the country. Commercially exploitable forests are concentrated in the Ovambo/Kavango/Caprivi area.

Land Use

Before independence the communal farming areas were seen essentially as a source of cheap labour for the mining and commercial ranching industries. Consequently, although it is the most densely settled, this zone is the least developed part of the country.

The main agricultural activity is mixed farming. A quarter of the national herd of cattle and goats and a

third of all poultry are owned by farmers here. Where arable farming is possible the main crop is pearl millet. Sorghum is also grown, and maize increases in importance towards the east, as rainfall becomes more reliable. The Caprivi Strip is the wettest part of the country and several cash crops, including cotton, rice and tobacco are grown there. A variety of vegetables, pulses, roots and tubers are grown by smallholders, and freshwater fish provides a significant proportion of their dietary protein.

There is some irrigation on commercial farms in the so-called 'maize triangle' near Tsumeb, and there are also some small *Eucalyptus* plantations in the area. The only area of large-scale commercial arable farming in the zone is on the *karstveld*.

Development Potential

Although environmental conditions in this zone are the most favourable in the country for crop and livestock production, there are a number of constraints which limit the productivity of smallholder farming systems. The lack of an effective marketing infrastructure for smallholder products is probably the single most important problem, but another major constraint is the lack of technological packages adapted to smallholder mixed farming systems and ecological conditions in the zone. Before independence the research and extension services virtually ignored the problems of smallholder farmers. As a consequence there is a great deal that needs to be done to develop the production, processing and marketing of smallholder products. Adaptive research on low-input communal mixed farming systems to identify the constraints on growth and their policy implications is urgently needed.

Another major challenge is to find effective ways of providing credit to smallholders. Improvements to the road network in the north are also essential if growth in the communal areas is to be sustained. Technical support for smallholders needs to be substantially improved almost everywhere. Increased veterinary services, better soil and water conservation, more efficient management of rangeland, improved storage of food crops and increased use of animal draught power are all areas requiring emphasis.

Labour shortages at critical periods in the farming year are a common problem, exacerbated by the absence of a substantial proportion of the adult males, away working in the mines and on the commercial ranches. Many households in the communal farming areas are headed by women who frequently have difficulty in meeting all the demands on their time. Home-based millet processing is a particularly time-consuming and arduous task. The development and introduction of simple machines to

relieve women of the drudgery involved in hand-pounding millet is universally regarded as a priority issue. The provision of domestic water supplies close to the homestead would be another effective way of increasing the amount of time women have available for farming activities.

Provided that access to markets and services is improved, there is significant scope for increasing crop and livestock production in the communal farming areas. This is in sharp contrast to the situation in the commercial sector, where productivity is probably close to the limit imposed by the poor land quality and limited water resources.

One approach to increasing production would be through improving the productivity of existing resources of land and labour. Improved animal disease control would have a significant impact on livestock production, but generally only marginal increases in productivity are likely in the short term using current levels of technology. The best prospects for increasing production of smallholder crops lie with the introduction of improved seed varieties, such as Okashana-1 an improved millet variety. Another possibility is increasing the area under cultivation. Draining the swampy river margins of the eastern Caprivi Strip would free valuable land for crop production in an area with good and relatively reliable rainfall. There is also scope for intensifying land use in the Otavi Highlands where soils are good and rain-fed crops produce fairly reliable yields.

Land use in the *sandveld* area between the Ovambo flood-plain and the Okavango River could also be intensified. What is lacking here is a supply of water to meet domestic and livestock needs. This could be provided from boreholes, but a better source would be the salt-free waters of the Okavango River.

Irrigating land in the Okavango valley would be another relatively inexpensive way of increasing production. Transporting water from the northern rivers to areas of irrigable *hardveld* soils further south is also a possibility, but this would be costly. In the absence of any tradition of irrigated farming by smallholders in the country funding would be difficult to justify without a major extension and training programme.

The rural population of Namibia is likely to continue to rely on wood to meet domestic requirements for fuel and building materials. Fuelwood reserves are already in short supply in the relatively densely settled areas of the north. As the population grows, better management of the limited indigenous woodlands, combined with community-based afforestation programmes will increasingly be needed if demand for forest products is to be met.

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